

REMARKS

After re-numbering by the Office, claims 1-5, 8-12 and 14-47 are now pending. Claims 1-5, 8-12 and 14-47 stand rejected. Applicants have cancelled claim 39 without prejudice or disclaimer to the subject matter contained therein. Claims 1-5, 8-12, 28, 29, 31, 34, 36, 37, 40, 46 and 47 have been amended. New claims 48 - 52 have been added. The specification has been amended. Applicants respectfully submit that support for the amendment to page 19 can be found in original claim 1, and similarly that support for the amendment to page 20 can be found in original claim 4. Reconsideration of the rejection is respectfully requested in view of these amendments and the following remarks.

The 35 U.S. C. §112 Rejections

Claims 5, 8, 23-31, 34, 35 and 36 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Action asserted that the “one or more coatings” are unduly vague and indefinite. Applicants respectfully submit that their changing this phrase to “at least one coating” renders this rejection moot. Applicants furthermore point out that the claimed invention recites that the “at least one coating” serves to provide chemical protection and a toughening mechanism for the composite. This further enhances clarity.

Claims 1-5, 8-12, 14-18 and 23-27 were rejected under 35 U.S. C. §112, first paragraph, because the specification, while being enabling for matrices having large fractions of Si metal and low fractions of SiC, allegedly does not reasonably provide enablement for matrices with large fractions of SiC and low fractions of Si. Applicants respectfully traverse this ground of rejection.

Applicants respectfully submit that the embodiment of Example V featuring the Grade EWC-600 carbon fibers resulted in a composite body containing 50-60 vol% SiC. This amount of silicon carbide represents the largest fraction of any component of this composite. For further details, see, for example, page 25, lines 26-30.

Claims 1-5, 8-12, 14-18 and 23-27 were also rejected under 35 U.S. C. §112, first paragraph, as being based upon a non-enabling disclosure. Specifically, the Action alleges that matrices with large fractions of Si metal and low fractions of SiC are critical or essential to the invention but are not included in the claims. Applicants respectfully traverse this ground of rejection.

Applicants respectfully submit that the only critical feature of the claimed invention is that the matrix be high in silicon; that is, the present invention focuses on “silicon-based” matrices. The specification at, for example, page 16, lines 16-23, discusses silicon-based composites made by siliconizing or by reactive infiltration, such as by molten silicon wetting and spontaneously infiltrating a porous mass of silicon carbide. The passage notes that the infiltration can be assisted by adding some elemental carbon to the porous mass such that it is

available to react chemically with the molten silicon. Applicants note, however, that where the matrix material consists predominantly of silicon and silicon carbide, high amounts of silicon tend to imply low amounts of silicon carbide. Applicants furthermore note that the present invention does not preclude composites having large fractions of silicon carbide, (should one want that). See, for example, page 17, lines 5-7. Composites having both large amounts of silicon and silicon carbide can be the case where the volume fraction of reinforcement is low, e.g., small amounts of carbon fiber.

Accordingly, applicants respectfully request that the enablement grounds of rejection be withdrawn.

The Prior Art Rejections

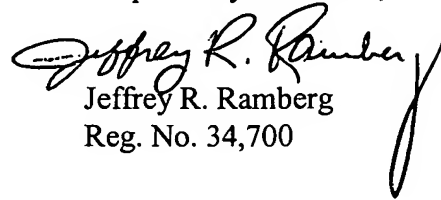
All of the pending claims were rejected under 35 U.S.C. §102(b) as being anticipated, or, in the alternative, under 35 U.S.C. §103 as being obvious over U. S. Patent No. 6,079,525 to Dietrich et al. (hereinafter referred to as “Dietrich”). Applicants respectfully traverse this rejection.

Applicants respectfully submit that Dietrich neither discloses nor suggests the claimed invention. In particular, independent claims 2, 3, 4 and 5 each requires at least about 20 percent by volume of silicon; and claim 37 calls for at least about 50 volume percent. In contrast, the composite body of Dietrich contains at most about 15% by volume silicon. Relatively large fractions of silicon are an important feature of the present invention because the desired low CTE is easier to achieve if the matrix has a relatively low elastic modulus, which silicon has, at least in comparison to silicon carbide. Independent method claim 1 is also patentable over Dietrich, applicants respectfully submit, because the invention as claimed calls for not more than about 25 volume percent silicon carbide. In contrast, Dietrich specifies SiC levels for his brake rotor and lining in the 40-50 volume percent range. Thus, applicants respectfully submit that the claimed invention is patentable over Dietrich, and that the rejection accordingly should be withdrawn.

Applicants respectfully submit that the present application meets the requirements for patentability. Accordingly, applicants respectfully request a Notice of Allowance directed to claims 1-38 and 40-52.

Should the Examiner deem that any further action on the part of applicants would be desirable, the Examiner is invited to telephone applicants' undersigned representative.

Respectfully submitted,


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August 25, 2003

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